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cytosis is an important feature that should be looked into. As to lichens, it is noted that the chemistry of the plant complex is very different from the chemistry of the sum of the components, grown as separate individuals; the nutritive relations of the algal symbionts are not known. Similar suggestions are made relative to the need of investigating the chemistry of parasitism, as illustrated by ergot, wheat rust, and their host plants.—H. C. COWLES.

Lichens in relation to their substratum.—BACHMANN,⁴² who for many years has paid attention to the substratum relations of lichens, has reported his observations on the lichens of granite and quartz. Granite is decomposed into a claylike substance by lichen tissue with some rapidity, the micaceous constituents being particularly subject to ready decay. The quartz elements, on the other hand, are extremely resistant to such decomposition.

In a later paper BACHMANN⁴³ reports the results of studies on calcareous lichens with *Chroolepus* gonidia. He finds that the *Chroolepus* itself is able to dissolve calcium carbonate, so that after a time a limestone becomes perforated in spongelike fashion through the agency of the *Chroolepus* cells of the fungal hyphae. As soon as the *Chroolepus* cells become inclosed by hyphae, they bud in a yeastlike manner and take on bizarre forms. On account of its position within a rock, such a lichen retains moisture longer than do ordinary superficial lichens.—H. C. COWLES.

Taxonomic notes.—WERNHAM⁴⁴ has described a new genus (*Neosabicea*) of Rubiaceae from Colombia. It belongs to the tribe Mussaendeae.

DÜMMER⁴⁵ has described two new species of *Callitris*, one from New Caledonia and the other from the mountains of Ngoye.

BENEDICT⁴⁶ has begun a revision of the genus *Vittaria*. The first paper is a discussion of seven species, representing the subgenus *Radiovittaria*, and includes two new species.

BAKER⁴⁷ has published a study of the African species of *Crotalaria*, preceding the descriptive list by a historical introduction, and also a discussion of the delimitation of the genus. The paper recognizes 309 species, the genus extending from Egypt and the Soudan and the Sahara to Cape Colony in the

⁴² BACHMANN, E., Die Beziehungen der Kieselflechten zu ihrer Unterlage. II. Granat und Quarz. Ber. Deutsch. Bot. Gesells. 29:261-273. figs. 4. 1911.

⁴³ ———, Der Thallus der Kalkflechten. II. Flechten mit *Chroolepugonidien*. Ber. Deutsch. Bot. Gesells. 31:3-12. pl. 1. 1913.

⁴⁴ WERNHAM, H. F., New Rubiaceae from tropical America. Jour. Botany 52: 225-277. pl. 533. 1914.

⁴⁵ DÜMMER, R. A., Three Conifers. Jour. Botany 52:236-241. 1914.

⁴⁶ BENEDICT, R. C., A revision of the genus *Vittaria* J. E. Smith. Bull. Torr. Bot. Club 41:391-410. figs. 7. pls. 15-20. 1914.

⁴⁷ BAKER, E. G., The African species of *Crotalaria*. Linn. Soc. London. Bot. 42:241-425. pls. 9-14. 1914.

south. In the list there are included descriptions of 76 new species and varieties.—J. M. C.

Flora of Shikotan.—TAKEDA⁴⁸ has studied somewhat intensively the flora of Shikotan, which is a small island situated near enough to the Kurile Islands to be regarded as one of them, at least in climatic conditions. The great interest of the islands in general is that the vegetation is quite primeval, nothing having been disturbed by the hand of man; in fact, Shikotan seems not to have been touched by human hands at all. An analysis of the floristic features is presented, and the enumeration includes 234 species, the largest assemblage being dicotyledons (219). The four largest families appear in the following order of abundance: Compositae, Gramineae, Rosaceae, and Umbelliferae. The largest genus is *Carex*, with 15 species; and 28 families are represented by a single genus, 23 of these genera being represented by a single species. The list includes the description of 5 new species.—J. M. C.

Phytogeographic notes from Palestine.—AARONSOHN⁴⁹ has called attention to some species that are disappearing from the flora of Palestine. He describes a little known station of *Acacia albida*, a species of northern Africa heretofore regarded as merely cultivated in Palestine. AARONSOHN regards it as an indigenous relict. Among other rare relicts in Palestine are *Pinus halepensis*, *Juniperus phoenicea*, and *Fraxinus oxycarpa oligophylla*. The author believes that these species, on account of the great need for wood in the arid Palestine climate, have been essentially exterminated by man. An interesting argument in support of this view, recalling the methods employed by the English ecologists in working out the original distribution of the beech, is based on the occurrence of place-names derived from these trees in neighborhoods where these species are no longer to be found.—H. C. COWLES.

U.S. Forest Service.—Among various articles of more or less general interest in a recent periodical, JAENICKE⁵⁰ gives a brief and interesting résumé of the varied activities of the Forest Service. This organization, employing the services of 2,895 persons, many of them with botanical training, and expending annually some \$6,000,000, devotes its attention to subjects ranging from purely botanical research through reforestation and forest protection to the sale of timber and the development of water power. With increasing interest in forest protection, there is coming an increasing demand for increasing

⁴⁸ TAKEDA, H., The flora of the island of Shikotan. Jour. Linn. Soc. Bot. 42: 433-510. 1914.

⁴⁹ AARONSOHN, A., Notules de phytogéographie palestinienne. (I). Une station peu connue de l'*Acacia albida* Del. (II). Espèces en voie d'extinction. Bull. Soc. Bot. France 60:495-503, 585-592. pl. 1. 1913.

⁵⁰ JAENICKE, A. J., Progress of the U.S. Forest Service as reflected in the forester's reports of 1911, 1912, 1913. Forestry Quarterly 12:397-407. 1914.